

WHAT IS CLAIMED IS:

1. A method of determining the prognosis of an individual having a breast tumor, comprising the step of:

5 examining the expression of Krüppel-like factor 4 (KLF4) in said breast tumor by immunohistochemistry, wherein a predominantly cytosolic staining indicates a greater likelihood of survival of the individual or a greater likelihood of response to a specific therapy, wherein a predominantly nuclear staining and a
10 lower cytosolic staining indicates a lower likelihood of survival or a lower likelihood of response to a specific therapy.

2 . The method of claim 1, wherein said immunohistochemistry employs a monoclonal antibody directed
15 against KLF4 protein.

3. The method of claim 2, wherein wherein said monoclonal antibody is designated IE5.

4. The method of claim 1, wherein said predominantly nuclear staining of KLF4 protein indicates an aggressive phenotype of early stage infiltrating ductal carcinoma.

5 5. The method of claim 1, wherein said predominantly nuclear staining of KLF4 protein indicates said individual has stage I or stage IIA breast tumor.

6. The method of claim 1, wherein said predominantly
10 nuclear staining of KLF4 protein is detected in tumor smaller or equal to about 2 cm.

7. The method of claim 6, wherein said predominantly
nuclear staining of KLF4 protein is detected in tumor having a
15 characteristic selected from the group consisting of high histologic grade, increased expression of Ki67 and reduced expression of BCL2 as compared to tumor without a predominant nuclear staining of KLF4.

8. An antibody directed against Krüppel-like factor 4, wherein said antibody is directed against residues 479-1197 of SEQ ID NO. 6.

5 9. The antibody of claim 8, wherein said antibody is a monoclonal antibody.

10. The antibody of claim 9, wherein said antibody is designated IE5.

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11. A method of monitoring a treatment thereby evaluating effectiveness of the treatment in an individual, comprising the step of:

administering the monoclonal antibody of claim 9 to said
15 individual prior to, during and post said treatment, wherein said antibody detects the localization and level of Krüppel-like factor 4 (KLF4) protein, and wherein decreases of KLF4 protein level indicate effective response of said individual to said treatment, so treatment is monitored and the effectiveness of said treatment is evaluated in
20 said individual.

12. The method of claim 11, wherein said treatment is selected from the group consisting of drug administration, radiation therapy, gene therapy and chemotherapy.

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13. The method of claim 11, wherein said individual suffers from breast carcinoma or oral squamous cell carcinoma.

14. A kit for monitoring a treatment thereby evaluating
10 effectiveness of the treatment in an individual, comprising the monoclonal antibody of claim 9 and a suitable carrier.

15. A method of detecting transforming activities of a carcinoma oncogene, comprising the steps of:

15 transforming epithelioid cells with said oncogene; and
detecting morphological transformation, wherein the presence of transformed cell lines indicates that said oncogene has transforming activities.

16. The method of claim 15, wherein said epithelioid cells are RK3E cells.

17. The method of claim 15, wherein said oncogene is
5 selected from the group consisting of *RAS*, *GKLF*, *c-MYC* and *GLI*.

18. The method of claim 15, wherein said method detects protein coding region of said oncogene without truncation or rearrangement.

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19. A method of identifying oncogenicity of a gene, comprising the steps of:

transforming epithelioid cells with said gene;

detecting transformed cell lines; and

15 measuring tumorigenicity of said transformed cell lines by injecting an animal with said transformed cell lines, wherein induction of tumors in said animal indicates oncogenicity of said gene.

20. The method of claim 19, wherein said epithelioid cells are
RK3E cells.

21. A method of identifying oncogene-specificity of a known
5 drug, comprising the steps of:
transforming epithelioid cells with said oncogene;
detecting transformed cell lines; and
contacting said transformed cell lines with said drug,
wherein if said drug inhibits proliferation or survival of said
10 transformed cell lines, said drug is specific for inhibiting said
oncogene.

22. The method of claim 21, wherein said epithelioid cells are
RK3E cells.
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23. The method of claim 21, wherein said oncogene is
selected from the group consisting of *RAS*, *GKLF*, *c-MYC* and *GLI*.

24. A method of screening for a drug functioning as an
20 inhibitor of an oncogene, comprising the steps of:

transforming epithelioid cells with said oncogene;
contacting said cells with said drug; and
detecting transformed cell lines; wherein absence of
transformed cell lines or reduced transformed cell lines compared to
5 those obtained without drug contact indicates that said drug is an
inhibitor of said oncogene.

25. The method of claim 24, wherein said epithelioid cells are
RK3E cells.

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26. The method of claim 24, wherein said oncogene is
selected from the group consisting of *RAS*, *GKLF*, *c-MYC* and *GLI*.

27. A method of screening for alterations in enzyme activity,
15 protein expression, or mRNA expression in association with an
oncogene, comprising the steps of:

transforming epithelioid cells with said oncogene; and
measuring the activity or expression level of said enzyme,
protein or mRNA, wherein if the activity or expression level of said
20 enzyme, protein or mRNA in transformed cell lines differs from that

in non-transformed cell lines, said oncogene regulates said enzyme activity, protein expression, or mRNA expression.

28. The method of claim 27, wherein said epithelioid cells are
5 RK3E cells.

29. The method of claim 27, wherein said oncogene is selected from the group consisting of *RAS*, *GKLF*, *c-MYC* and *GLI*.

10 30. A method of treating an individual having a carcinoma, comprising the step of administering a drug to said individual, wherein said drug inhibits the expression or activity of *Krüppel-like factor 4 (KLF4)*.

15 31. The method of claim 30, wherein said carcinoma is breast carcinoma or oral squamous cell carcinoma.

32. A method of monitoring a treatment thereby evaluating effectiveness of the treatment in an individual, comprising the step
20 of:

detecting the expression levels of *Krüppel-like factor 4* (*KLF4*) in said individual prior to, during and post said treatment, wherein decreases of said expression levels of *KLF4* indicate effective response of said individual to said treatment, therefore, said treatment is monitored and the effectiveness of said treatment is evaluated in said individual.

33. The method of claim 32, wherein said treatment is selected from the group consisting of drug administration, radiation therapy, gene therapy and chemotherapy.

34. The method of claim 32, wherein said individual suffers from breast carcinoma or oral squamous cell carcinoma.

35. A DNA molecule encoding a Gut-Enriched Krüppel-Like Factor/Epithelial Zinc Finger (GKLF) protein selected from the group consisting of:

- (a) isolated DNA that has the sequence of SEQ ID NO.5;
- (b) isolated DNA which encodes a GKLF protein that has the sequence of SEQ ID NO.6; and

(c) isolated DNA differing from the isolated DNAs of (a) and (b) above in codon sequence due to the degeneracy of the genetic code, and which encodes a GKLF protein.

5 36. A vector capable of expressing the isolated DNA of claim 35 in a recombinant cell, said vector comprises said DNA and regulatory elements necessary for expressing said DNA in the cell.

10 37. A host cell transfected with the vector of claim 36, said vector expressing a GKLF protein.

 38. The host cell of claim 37, wherein said cell is selected from group consisting of bacterial cells, mammalian cells, plant cells, yeast cells and insect cells.

15 39. An isolated and purified GKLF protein coded for by DNA molecule selected from the group consisting of:

 (a) isolated DNA that has the sequence of SEQ ID NO.5;
and

(b) isolated DNA differing from the isolated DNA of (a) above in codon sequence due to the degeneracy of the genetic code, and which encodes a GKLF protein.

5 40. The isolated and purified GKLF protein of claim 39 having the amino acid sequence shown in SEQ ID No: 6.